

CLAIMS

What is claimed is:

1. A two-phase data transfer protocol circuit for a micropipeline, said circuit comprising:

a control element for generating micropipeline data transfer control signals according to a multiple phase protocol; and

a pulse generator connected to said micropipeline and operable to produce pulse signals responsive to both rising and falling edges of said data transfer control signals.

1 2. The circuit of claim 1, further comprising a level-
2 sensitive latch for holding and propagating data through
3 said micropipeline.

1 3. The circuit of claim 2, wherein said pulse generator
2 is a dual-pulse generator that delivers a data transfer
3 pulse to said level-sensitive latch in response to both
4 said rising edge and said falling edge of said data
5 transfer control signals.

1 4. The circuit of claim 1, wherein said control element
2 is a Muller C-element.

1 5. The circuit of claim 1, wherein said pulse generator
2 comprises:

3 a logic gate having a first input and a second
4 input, wherein said first input is connected to the
5 output of said control element; and

6 a delay element connected between the output of said
7 control element and said second input, wherein a pulse is
8 produced at the output of said logic gate in accordance
9 with the delay imparted on said data transfer control
10 signal by said delay element.

1 6. The circuit of claim 5, wherein said logic gate is a
2 XOR gate.

1 7. The circuit of claim 5, wherein said delay element
2 comprises an even number of inverters.

1 8. A micropipeline comprising:

2 a plurality of C-elements for providing sequential
3 data transfer control among a plurality of data
4 processing stages within said micropipeline;

5 a plurality of latches for holding and propagating
6 data through said plurality of processing stages; and

 a plurality of dual-pulse generators for translating
 signal transitions from the outputs of said C-elements
 into latch control pulses for said plurality of latches.

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converting both a rising edge and a falling edge of said data transfer control signal into a pulse signal such that said micropipeline transfers data during both said rising edge and said falling edge.

1 10. The method of claim 9, further comprising holding
2 and propagating data through said micropipeline utilizing
3 a level-sensitive latch.

1 11. The method of claim 10, wherein said micropipeline
2 includes a Muller C-element for generating said data
3 transfer control signal, and wherein said converting a
4 rising edge and a falling edge of said data transfer
control signal into pulse signals is performed utilizing
a dual pulse generator, said method further comprising:

applying said data transfer control signal from said
Muller C-element to the input of said dual pulse
generator; and

delivering said data transfer pulses from said dual
pulse generator to said level-sensitive latch in response
to a rising edge and a falling edge of said data transfer
control signal.